HW Answers: Further Investigation of *a* and *d*

2a. The value of A does not tell you the max and min values always because if D is not equal to zero then the graph has been shifted up or down which would, thus, move the maximum and minimum values up or down.

2b. To get the maximum value start with the axis of oscillation and add the amplitude.
To get the minimum value start with the axis of oscillation and subtract the amplitude.

In other words, Max = D + A and Min = D – A

2c. The axis of oscillation is the horizontal line that goes through the middle value of a sine wave.

2d. The axis of oscillation is the average of the maximum and minimum values.

In other words $D = \frac{Max + Min}{2}$

2e. The amplitude is the distance between the axis of oscillation and the maximum or minimum values of a trig. function.

2f. To find the amplitude I would first use the max and min values to get the axis of oscillation (see 2d.) and then I would find the distance between axis of oscillation and the maximum or minimum values.

3a. 2
3d. 3
3e. Cosine because the graph "starts" at a maximum point
3f. $y = 3\cos x + 2$

5a. Look at the place where the graph crosses the *y-axis*. In other words, where $x = 0$.

5b.

$y = \sin x$: Graph passes through the axis of oscillation and is increasing
$y = -\sin x$: Graph passes through the axis of oscillation and is decreasing
$y = \cos x$: Graph is at a maximum
$y = -\cos x$: Graph is at a minimum

(c) For each function below, imagine and then describe what the graph would look at the same value of x as before.

$y = 5\sin x + 3$: At y = 3 and increasing
$y = -5\sin x + 3$: At y = 3 and decreasing
$y = 5\cos x + 3$: At maximum (0, 8)
$y = -5\cos x + 3$: At minimum (0, -2)

6a. +cos
6b. y = -1
6c. 2
6d y = 2cosx – 1